PEER REVIEW HISTORY

ARTICLE DETAILS

TITLE (PROVISIONAL)	Modelling Palliative and End of Life resource requirements during COVID-19: implications for quality care
AUTHORS	Chalk, Daniel; Robbins, Sara; Kandasamy, Rohan; Rush, Kate; Aggarwal, Ajay; Sullivan, Richard; Chamberlain, Charlotte

VERSION 1 – REVIEW

REVIEWER	Stone, Pat Columbia University, School of Nursing
REVIEW RETURNED	13-Oct-2020

GENERAL COMMENTS	This is an interesting paper modeling the increased nursing and specialist time as well as medication and equipment to provide needed EoL palliative care to a community experiencing the pandemic. Delineating the "staff and stuff" needed to provide palliative care is important. Major points 1. The abstract and paper start off US burden of COVID, but the model is English based. Either use world wide estimates, or European (at least) estimates. There is a disconnect. 2. Results, abstract, I would not start both the primary and secondary outcome measures and results sections with "the model predicts…". Just say "A mean… 3. It is not clear what palliative care MDT is. 4. The authors state that palliative care planning requires 4 elements, 'staff, stuff, space and systems'. Space and systems are then completely ignored without directing the reader that the model only considers staff and stuff. Also, when introducing these 4 elements, it might help to give examples. 5. The modelers do not consider lagging time when estimating the number of cases and deaths. The number of cases on a given day is probably associated with the number of deaths 2 weeks later (at least). This point should be considered and at least discussed if not incorporated. 6. If palliative care was offered, wouldn't there be less transfers to the hospitals allowing the patients to die in their homes or care homes? 7. The development of the estimates for the time is not well explained. The authors state a conceptual model was designed in collaboration with practicing clinicians….How many of each expert was on this panel. What was the conceptual model? How were the estimates actually derived. Was there a consensus building process (a Delphi

	study)? 8. The bundles are explained on page 7 line 9, but there is not discussion here of the 3 levels of the bundle. That comes up late on page 8. Please re-organize and clearly state what is in each bundle before discussing how each bundle was applied to different patient populations. Furthermore, it is not clear if there was 3 levels for each care setting had these 3 levels. It doesn't seem so from Table 1. 9. More explanation is needed why the model needs to warm up. It is not clear. 10. Table 1 the "Frequency within Care Setting" column is not clear. 11. Even though this is not a cost-effectiveness analysis, the authors might want to review and cite some recent cost-effectiveness analyses of palliative care models of delivery. Minor points Some places in the manuscript EoL and end of life are both used, sometimes in the same sentence.

REVIEWER	Ding, Jinfeng University of Western Australia, School of Population and Global Health
REVIEW RETURNED	23-Nov-2020

GENERAL COMMENTS	Thank you very much for the opportunity of reviewing this important article. It is an important and timely work that responds to challenges in provision of quality palliative and end-of life-care during COVID-19 pandemic. I enjoyed reading this paper and salute the authors for this excellent work. However, I have concerns with the Methods estimating the percentage of patients requiring EoL care in hospital. In page 7, the authors used number (29) of patients dying in hospital and number (130) of new cases over the same four days to estimate the percentage of patients requiring EoL care in hospital. However, I think the calculation should be based on all existing patients, not just new cases. Also, four days seem to be too short for this estimate. In the next paragraph, it is difficult for me to understand how the figures were calculated, such as the 46.8 new cases per days, 11.5 per day in care homes and 6.2 per day at home etc. The authors need to give clear explanations. I hope comments will help improve this important work.

VERSION 1 – AUTHOR RESPONSE

Reviewer: 1

Comments to the Author

This is an interesting paper modelling the increased nursing and specialist time as well as medication and equipment to provide needed EoL palliative care to a community experiencing the pandemic. Delineating the "staff and stuff" needed to provide palliative care is important.
Major points
1. The abstract and paper start off US burden of COVID, but the model is English based. Either use world wide estimates, or European (at least) estimates. There is a disconnect.

This has now been updated. Thank you.

2. Results, abstract, I would not start both the primary and secondary outcome measures and results sections with "the model predicts…". Just say "A mean…
This has now been updated. Thank you.

3. It is not clear what palliative care MDT is.
Apologies- the abbreviation is now detailed. Thank you.

4. The authors state that palliative care planning requires 4 elements, 'staff, stuff, space and systems'. Space and systems are then completely ignored without directing the reader that the model only considers staff and stuff. Also, when introducing these 4 elements, it might help to give examples.
Thank you for this important point. This has now been improved in the text to include examples, as well as an explanation for the focus on staff and stuff in the model. Thank you.

5. The modellers do not consider lagging time when estimating the number of cases and deaths. The number of cases on a given day is probably associated with the number of deaths 2 weeks later (at least). This point should be considered and at least discussed if not incorporated.
Text added to highlight that our approximation does not consider the lag, but should be a sufficient approximation for the model, particularly as we're modelling a relatively 'stable' peak.

6. If palliative care was offered, wouldn't there be less transfers to the hospitals allowing the patients to die in their homes or care homes?
We believe there may be a misunderstanding here. We don't actually model transfers between settings in this version of the model, although we do outline how there is capacity within the model to accommodate this. If this was being done, then the reviewer's comments would be a very sensible consideration when thinking about modelling this aspect.

7. The development of the estimates for the time is not well explained. The authors state a conceptual model was designed in collaboration with practicing clinicians….How many of each expert was on this panel. What was the conceptual model? How were the estimates actually derived. Was there a consensus building process (a Delphi study)?
Thank you. A formal Delphi consensus approach was not undertaken during the pandemic wave due to capacity for staff. However, an iterative approach with email correspondence was undertaken with key members of the community and specialist teams. We have amended the methods section to clarify the approach and added a sentence in the limitations of the discussion to better reflect this.

8. The bundles are explained on page 7 line 9, but there is not discussion here of the 3 levels of the bundle. That comes up late on page 8. Please re-organize and clearly state what is in each bundle before discussing how each bundle was applied to different patient populations. Furthermore, it is not clear if there was 3 levels for each care setting had these 3 levels. It doesn't seem so from Table 1.
Additional text has been added outlining the three bundles of care (and one for hospital setting) at the start of the relevant section, and also added text explaining the three tiers of need for patients at home.

9. More explanation is needed why the model needs to warm up. It is not clear.
Added text to better explain the "warm up" period in the model

10. Table 1 the "Frequency within Care Setting" column is not clear.
This has now been updated. Thank you.

11. Even though this is not a cost-effectiveness analysis, the authors might want to review and cite some recent cost-effectiveness analyses of palliative care models of delivery.

A sentence has been added to the discussion section. This is an interesting area, but one we can not adequately address within this study. Thank you.

Minor points
Some places in the manuscript EoL and end of life are both used, sometimes in the same sentence.

This has now been updated. Thank you.

Reviewer: 2

Comments to the Author
Thank you very much for the opportunity of reviewing this important article. It is an important and timely work that responds to challenges in provision of quality palliative and end-of life-care during COVID-19 pandemic. I enjoyed reading this paper and salute the authors for this excellent work.
However, I have concerns with the Methods estimating the percentage of patients requiring EoL care in hospital. In page 7, the authors used number (29) of patients dying in hospital and number (130) of new cases over the same four days to estimate the percentage of patients requiring EoL care in hospital. However, I think the calculation should be based on all existing patients, not just new cases.
Also, four days seem to be too short for this estimate.
These are very fair points, but unfortunately there was very limited data at the time we undertook the project, and so we were looking for some sufficiently usable estimates that would be enough to parameterise the model. We would of course use updated data for any further work, and would encourage others using the model to do the same.

In the next paragraph, it is difficult for me to understand how the figures were calculated, such as the 46.8 new cases per days, 11.5 per day in care homes and 6.2 per day at home etc.
Added text to better explain how the cases per day were estimated

The authors need to give clear explanations.
I hope comments will help improve this important work.

VERSION 2 – REVIEW

REVIEWER	Ding, Jinfeng University of Western Australia, School of Population and Global Health
REVIEW RETURNED	21-Dec-2020

GENERAL COMMENTS	I am happy with the authors' responses to my comments.